

CONTAINS:
AUGUST 1991
UNITED
STATES
CLIMATE
SUMMARY

WEEKLY CLIMATE BULLETIN

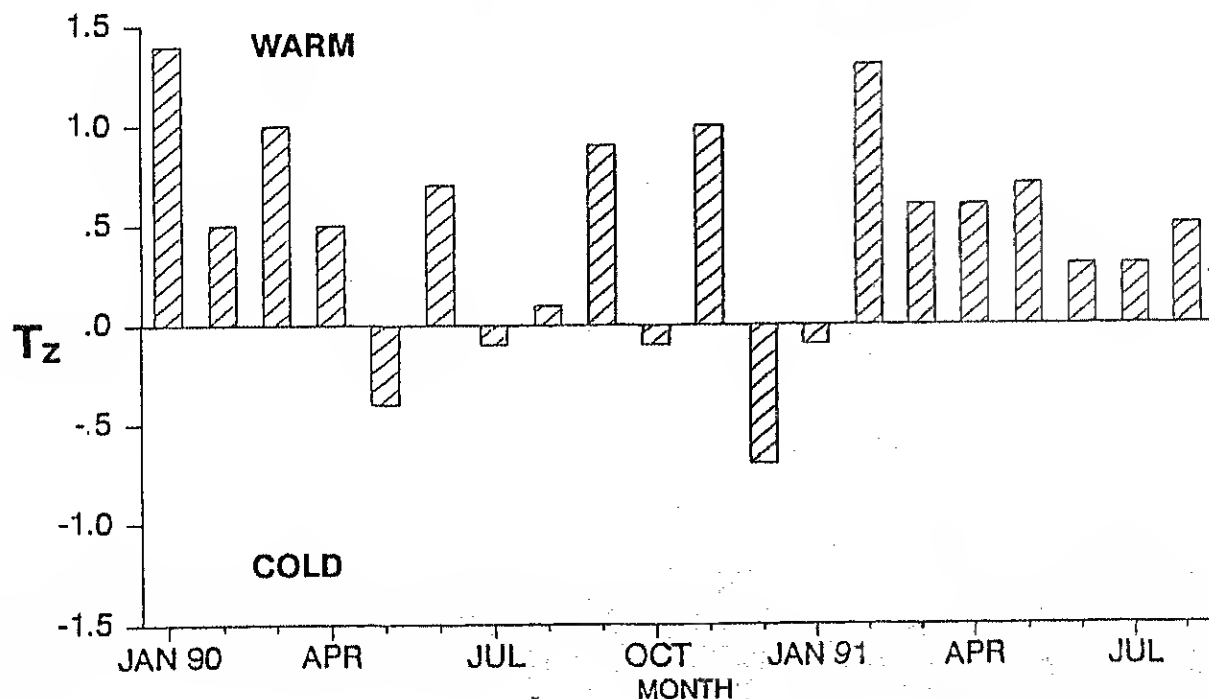
No. 91/36

Washington, DC

September 7, 1991

U.S. NATIONAL TEMPERATURE

NORMALIZED DEPARTURES, 1/1990-8/1991



National Climatic Data Center, NOAA

Ever since the fourth coldest December on record chilled all but the Far West in 1989, abnormally mild conditions have generally persisted across the nation. Normalized departures averaged across the contiguous United States indicate that only May 1990 and December 1990 were significantly below normal. Eight of these 20 months were among the ten warmest such months since 1895, including the mildest January (1990) on record.



UNITED STATES DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL WEATHER SERVICE-NATIONAL METEOROLOGICAL CENTER
CLIMATE ANALYSIS CENTER



UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF SEPTEMBER 1 - 7, 1991

Torrential rains in parts of the southern Great Plains, upper Midwest, and central Rockies highlighted the first week of the meteorological Fall [September-November]. The combination of an upper-level weather disturbance and a stationary front triggered numerous showers and thunderstorms in eastern Texas and Oklahoma early in the week, dumping more than 6 inches of rain on Oklahoma City in two days while Crockett, TX received 7.5 inches from late Saturday to Sunday [Sep. 1] afternoon (Figure 1). Late in the week, copious rains from strong thunderstorms produced severe flooding in south-central (9.5 inches at Glencoe, over 7 inches at Hector) and northeastern Minnesota (more than 4 inches at Duluth). Farther west, Utah was battered by rain on Saturday and Sunday. A 24-hour state rainfall record was set at North Ogden when 8.4 inches fell on Sep. 7-8, including nearly 6 inches between 2:30 and 4:30 p.m. Saturday. In the Atlantic, Tropical Storm Claudette rapidly strengthened to a major hurricane with sustained winds of 125 mph, but its track posed no immediate threat to the U.S. mainland. Abnormal warmth returned to the Far West and has persisted in the north-central U.S. since mid-August. Farther east, however, much cooler weather covered New England and the mid-Atlantic. Most of Alaska experienced near to slightly above normal temperatures, with significant precipitation limited along the southeastern coast. In Hawaii, mild and dry weather prevailed.

As September commenced, a cold front rapidly pushed southeastward from south-central Canada to off the East Coast by early Monday, bringing cool and dry air to the Northeast and mid-Atlantic, with Newcomb, NY falling to 30°F Monday morning. Farther west, widespread showers and thunderstorms drenched the southern and central Great Plains while scattered monsoonal thundershowers dropped locally heavy rains on parts of the desert Southwest and Great Basin. Highs in the eighties and nineties prevailed across much of the Far West, with San Francisco soaring to a record 92°F on Monday. On Tuesday, a second cold front triggered severe thunderstorms in the south-central Great Plains and Midwest, but brought welcome rains to the latter area. Additional thundershowers developed in the desert Southwest, producing golfball-sized hail near Big Bear Lake, CA on Wednesday.

During the latter half of the week, the cold front stalled across the Tennessee Valley and mid-Atlantic, generating scattered showers and thunderstorms along the front. A reinforcing shot of cold air pushed southward into the upper Midwest and northern Plains, briefly dropping temperatures to near freezing and producing scattered frost Friday morning in northern Minnesota. By Saturday, however, warm and humid Gulf air had pushed northward into the region, triggering intense and heavy thunderstorms across the upper Mississippi Valley. Unsettled weather in the West also generated scattered strong thundershowers, including the cloudburst in North Ogden, UT.

According to the River Forecast Centers, the largest weekly totals (more than 4 inches) occurred in central Oklahoma, southeastern Texas and Louisiana, and south-central Minnesota (Table 1). Elsewhere, light to moderate amounts fell on portions of the desert Southwest, southern and central Rockies, most of the Plains, eastern Hawaii, along the southern Alaskan coast, and throughout much of the eastern half of the nation. Little or no precipitation was observed in the Far West, northern Rockies and Plains, the remainder of Alaska and Hawaii, and in the central Tennessee Valley, northern New England, central Carolinas, southern Georgia, and northern Florida.

For the third consecutive week, abnormal warmth was recorded in the north-central Rockies and Plains as temperatures averaged between 6°F and 10°F above normal (Table 2). Above normal temperatures also covered the remainder of the West, across most of Alaska, and much of the Midwest, Tennessee Valley, and central Gulf Coast. Highs soared into the nineties in the north-central U.S. while the central valleys of California hit triple-digit readings.

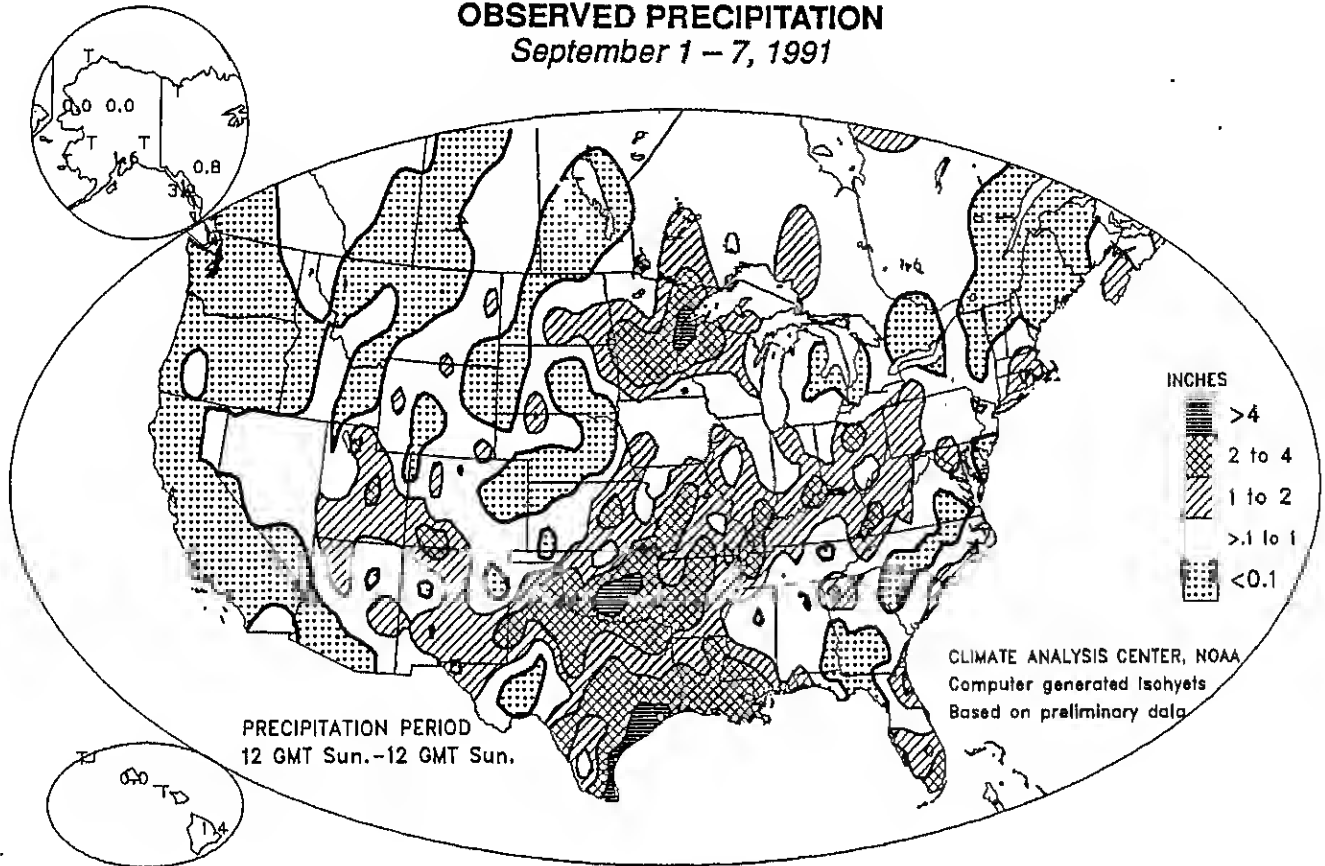
Much cooler and drier air replaced late August heat and humidity across New England and the mid-Atlantic while frequent cloud cover and rainfall kept temperatures lower than normal in the southern Rockies and Plains and central Gulf Coast. Departures less than -3°F were limited to coastal areas of the mid-Atlantic and southern California and parts of the southern Great Plains (Table 3).

TABLE 1. SELECTED STATIONS WITH 3.00 OR MORE INCHES OF PRECIPITATION DURING THE WEEK OF SEPTEMBER 1 - 7, 1991

| <u>STATION</u> | <u>TOTAL (INCHES)</u> | <u>STATION</u> | <u>TOTAL (INCHES)</u> |
|----------------------------|---------------------------|----------------------|---------------------------|
| YAKUTAT, AK | 9.85 | GALVESTON, TX | 3.93 |
| PALACIOS, TX | 8.12 | LAFAYETTE, LA | 3.89 |
| OKLAHOMA CITY, OK | 6.91 | CORPUS CHRISTI, TX | 3.76 |
| BILOXI/KEESLER AFB, MS | 4.61 | KINGSVILLE NAS, TX | 3.60 |
| FT SILL/HENRY POST AAF, OK | 4.43 | SITKA, AK | 3.42 |
| COLLEGE STATION, TX | 4.28 | HOMESTEAD AFB, FL | 3.40 |
| WICHITA FALLS, TX | 4.19 | JUNEAU, AK | 3.34 |
| DULUTH, MN | 4.14 | BROWNSVILLE, TX | 3.34 |
| MCCOMB, MS | 4.08 | JACKSONVILLE NAS, FL | 3.29 |
| HOUSTON/WILLIAM HOBBY, TX | 4.01 | REDWOOD FALLS, MN | 3.15 |

OBSERVED PRECIPITATION

September 1 - 7, 1991



DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

September 1 - 7, 1991

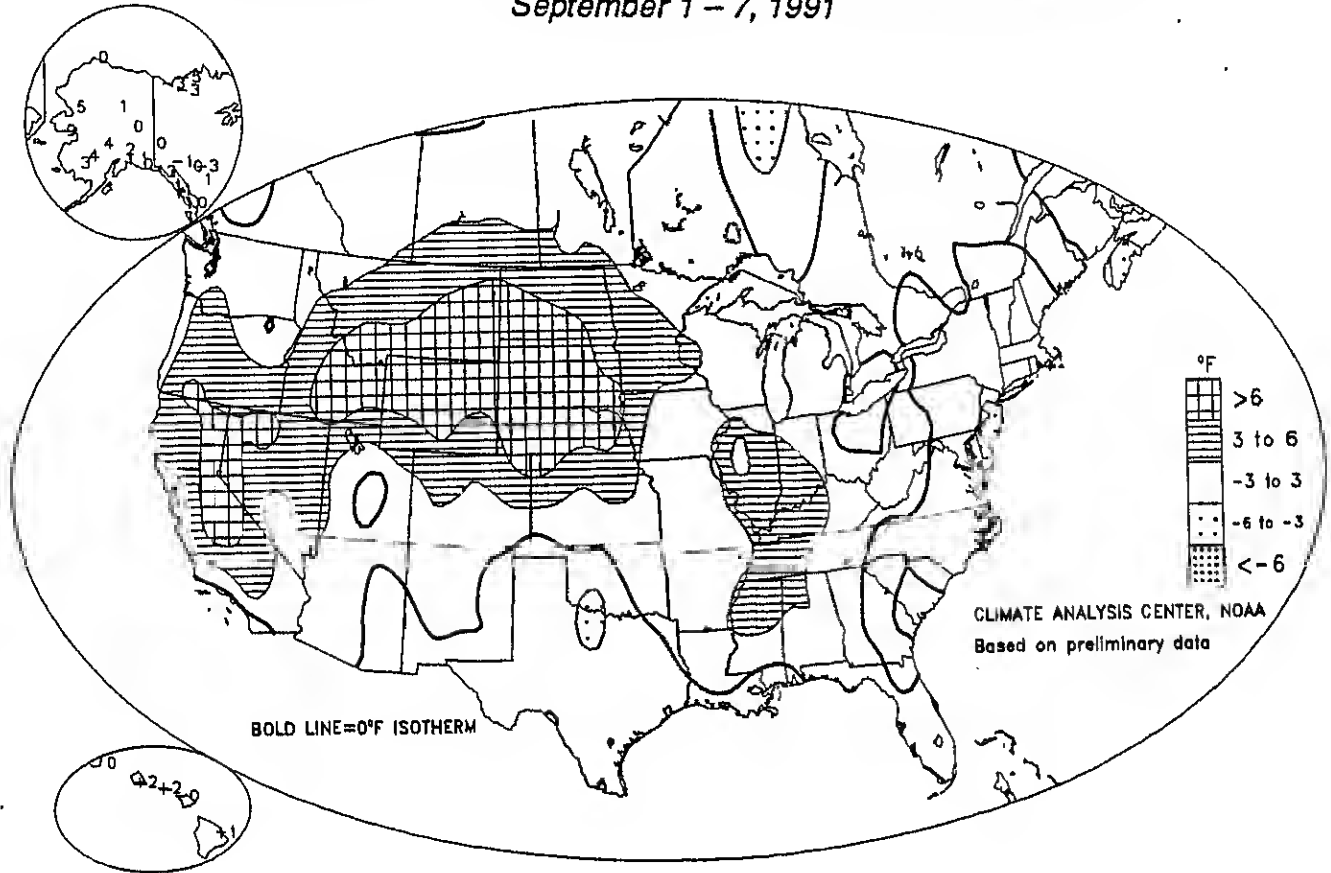


TABLE 2. SELECTED STATIONS WITH TEMPERATURES AVERAGING 7.0°F OR MORE ABOVE NORMAL FOR THE WEEK OF SEPTEMBER 1 - 7, 1991

| <u>STATION</u> | <u>DEPARTURE</u> (°F) | <u>AVERAGE</u> (°F) | <u>STATION</u> | <u>DEPARTURE</u> (°F) | <u>AVERAGE</u> (°F) |
|----------------|--------------------------|------------------------|-----------------|--------------------------|------------------------|
| SHERIDAN, WY | +9.5 | 71.6 | FRESNO, CA | +7.4 | 84.0 |
| WORLAND, WY | +9.1 | 71.7 | BISMARCK, ND | +7.4 | 69.3 |
| NOME, AK | +9.0 | 55.5 | GILLETTE, WY | +7.3 | 71.1 |
| HELENA, MT | +8.7 | 68.4 | CODY, WY | +7.3 | 59.0 |
| PIERRE, SD | +8.6 | 75.6 | VALENTINE, NE | +7.2 | 72.9 |
| MILES CITY, MT | +8.0 | 72.9 | RAPID CITY, SD | +7.2 | 72.6 |
| DICKINSON, ND | +7.9 | 69.0 | IDAHO FALLS, ID | +7.1 | 68.3 |
| RENO, NV | +7.7 | 71.2 | BOZEMAN, MT | +7.1 | 65.7 |
| BURLEY, ID | +7.5 | 70.5 | HURON, SD | +7.0 | 72.4 |

TABLE 3. SELECTED STATIONS WITH TEMPERATURES AVERAGING 2.5°F OR MORE BELOW NORMAL FOR THE WEEK OF SEPTEMBER 1 - 7, 1991

| <u>STATION</u> | <u>DEPARTURE</u> (°F) | <u>AVERAGE</u> (°F) | <u>STATION</u> | <u>DEPARTURE</u> (°F) | <u>AVERAGE</u> (°F) |
|-----------------------------|--------------------------|------------------------|---------------------------|--------------------------|------------------------|
| ATLANTIC CITY, NJ | -5.1 | 65.4 | PATUXENT RIVER NAS, MD | -2.8 | 72.0 |
| WRIGHTSTOWN/MCGUIRE AFB, NJ | -3.9 | 68.8 | WICHITA FALLS, TX | -2.8 | 77.3 |
| TRENTON, NJ | -3.8 | 67.1 | HARRISBURG, PA | -2.7 | 67.9 |
| FT SILL/HENRY POST AAF, OK | -3.8 | 75.6 | WILMINGTON, DE | -2.7 | 68.8 |
| SALISBURY, MD | -3.7 | 68.4 | GOLDSBORO/JOHNSON AFB, NC | -2.7 | 73.6 |
| TUCUMCARI, NM | -3.5 | 69.8 | SAN DIEGO/LINDBERGH, CA | -2.6 | 69.1 |
| MILLVILLE, NJ | -3.4 | 68.0 | PALACIOS, TX | -2.6 | 79.1 |
| DOVER AFB, DE | -3.3 | 68.8 | GLENS FALLS, NY | -2.5 | 60.6 |
| WINSLOW, AZ | -2.8 | 69.9 | ABILENE, TX | -2.5 | 76.9 |

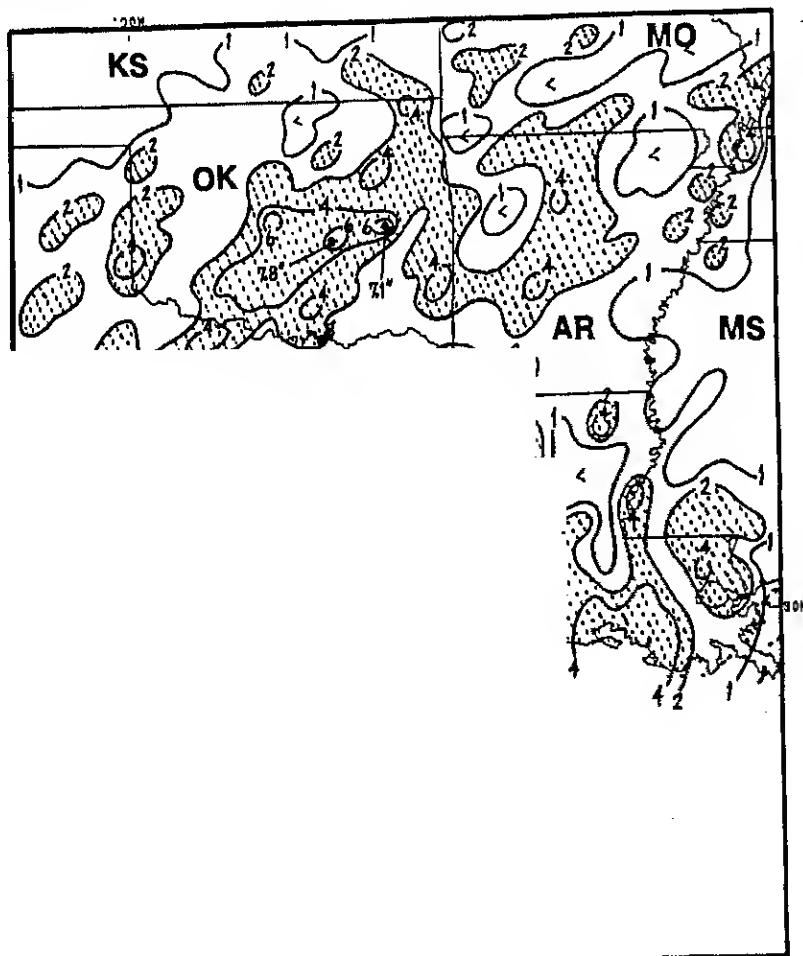
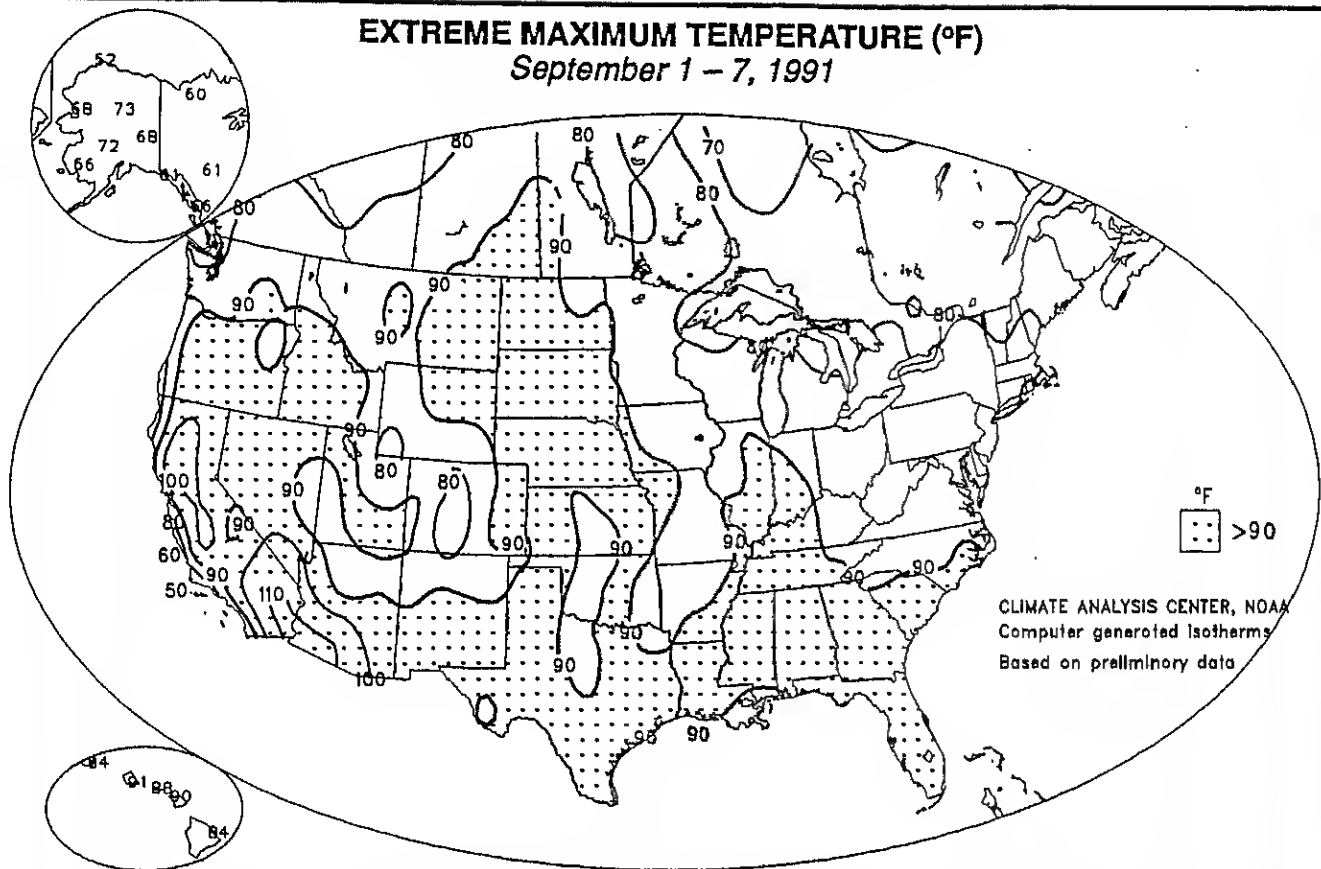


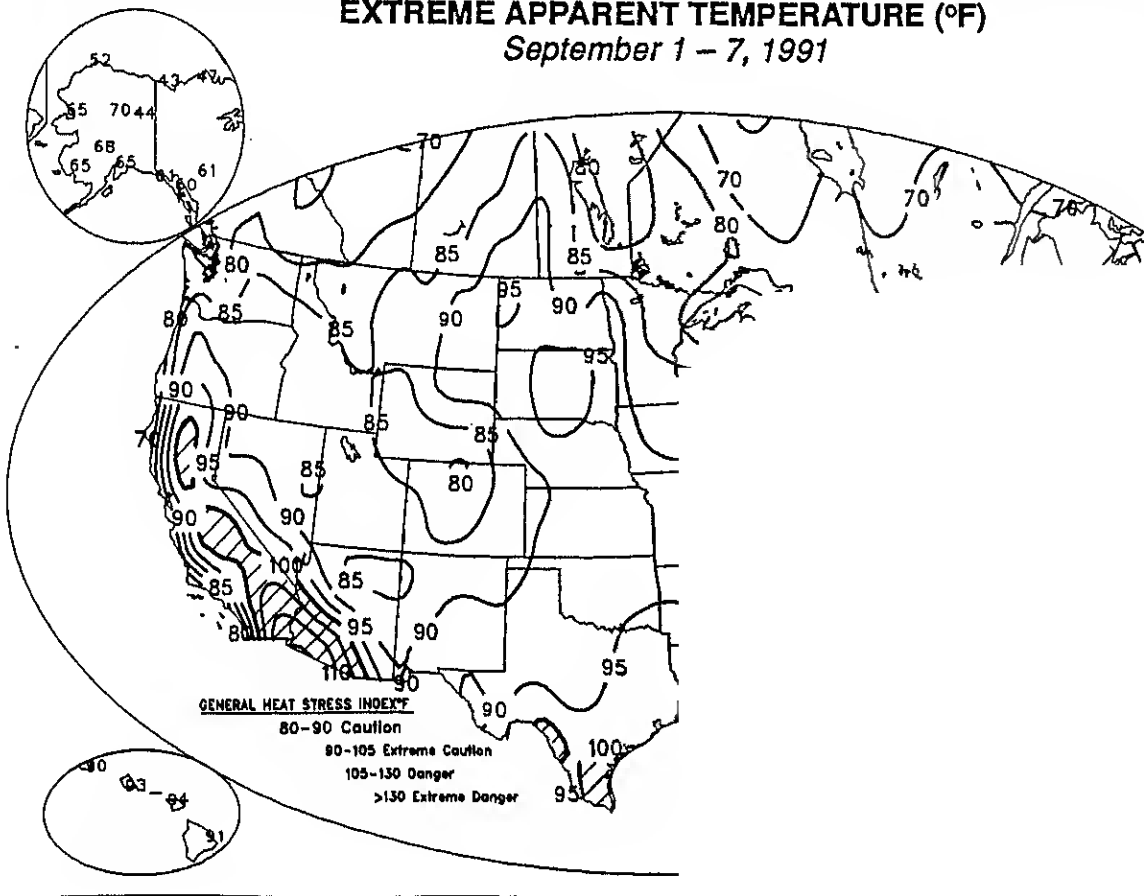
FIGURE 1. Total Precipitation (inches) During September 1 - 7, 1991. Isohyets are drawn only for 1, 2, 4, and 6 inches. Stippled areas received over 2 inches. Thunderstorms rumbled across the southern Plains and lower Mississippi Valley, soaking much of the area with heavy rain. Up to 10.6 inches doused portions of the Texas Gulf Coast while more than 7 inches fell across central Oklahoma.

EXTREME MAXIMUM TEMPERATURE (°F) **September 1 – 7, 1991**



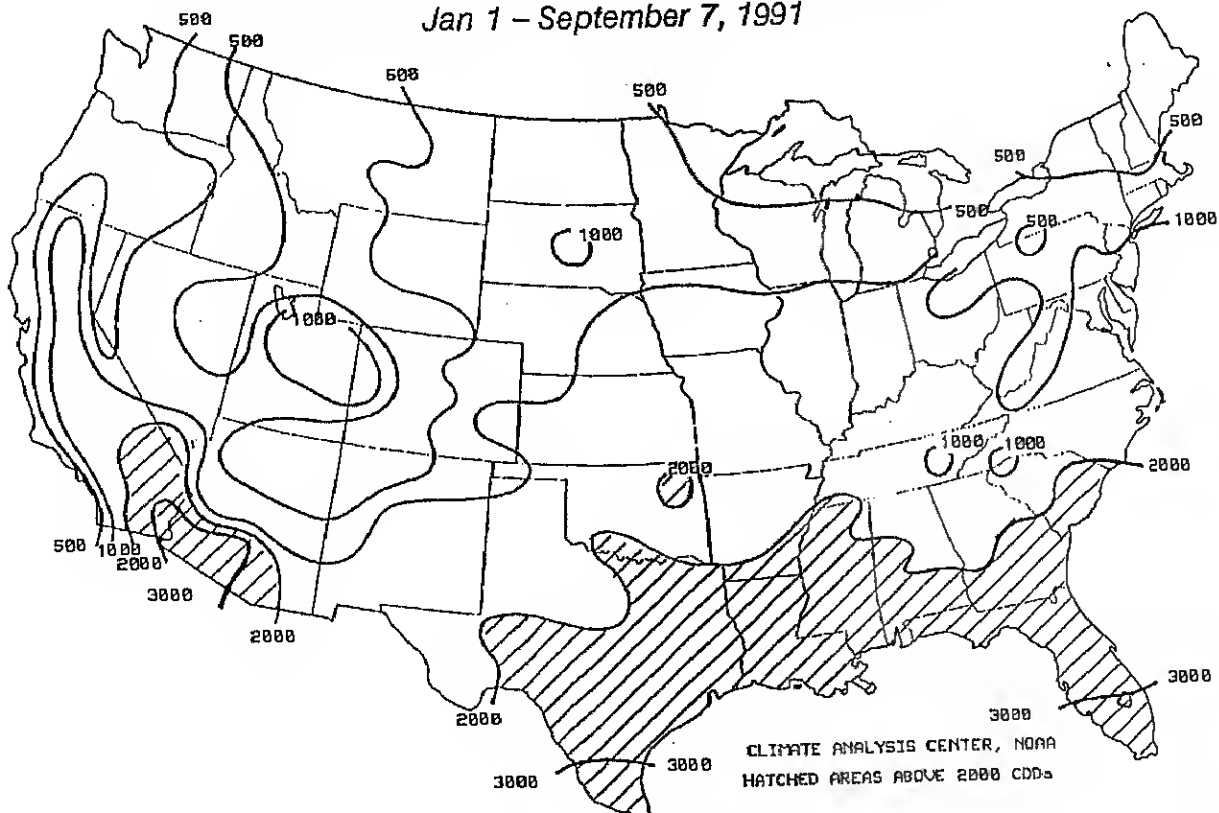
Abnormally warm air spread across the Great Plains as temperatures exceeded 90°F as far north as Saskatchewan and Manitoba. Triple digit readings, however, were confined to the desert Southwest and interior California (top). High humidities combined with high temperatures to produce apparent temperatures greater than 100°F only in southern Florida, the lower Rio Grande Valley, the desert Southwest, and interior California (bottom).

EXTREME APPARENT TEMPERATURE (°F) **September 1 – 7, 1991**



SEASONAL TOTAL COOLING DEGREE DAYS

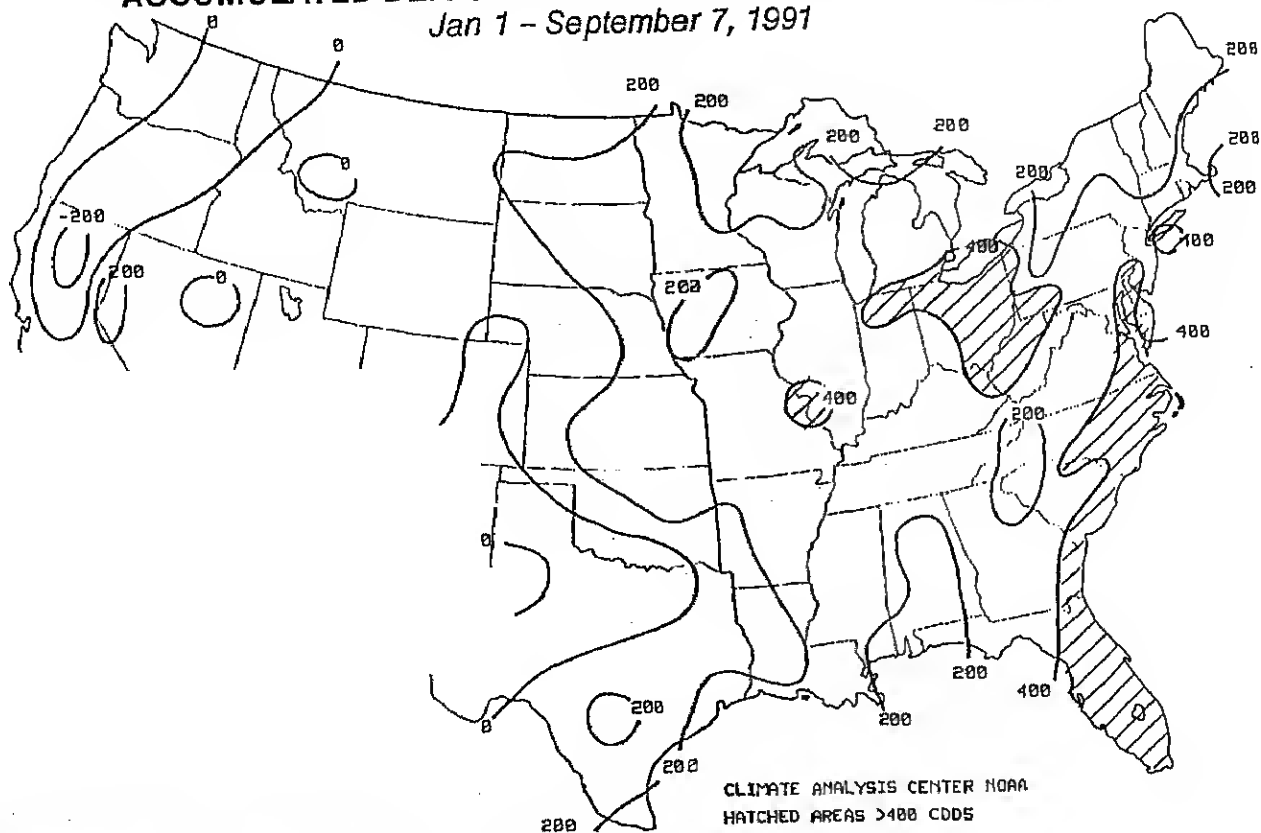
Jan 1 - September 7, 1991



Unseasonably warm weather since the beginning of the year has generated significant cooling usage (> 200 CDD's) in the southern tier of states (top). Abnormally warm conditions in the eastern U.S. have resulted in well above normal cooling demand (> 400 CDD's) along the southern and mid-Atlantic coast, in the central Appalachians and upper Ohio Valley, and in small parts of the middle Mississippi Valley and desert Southwest (bottom).

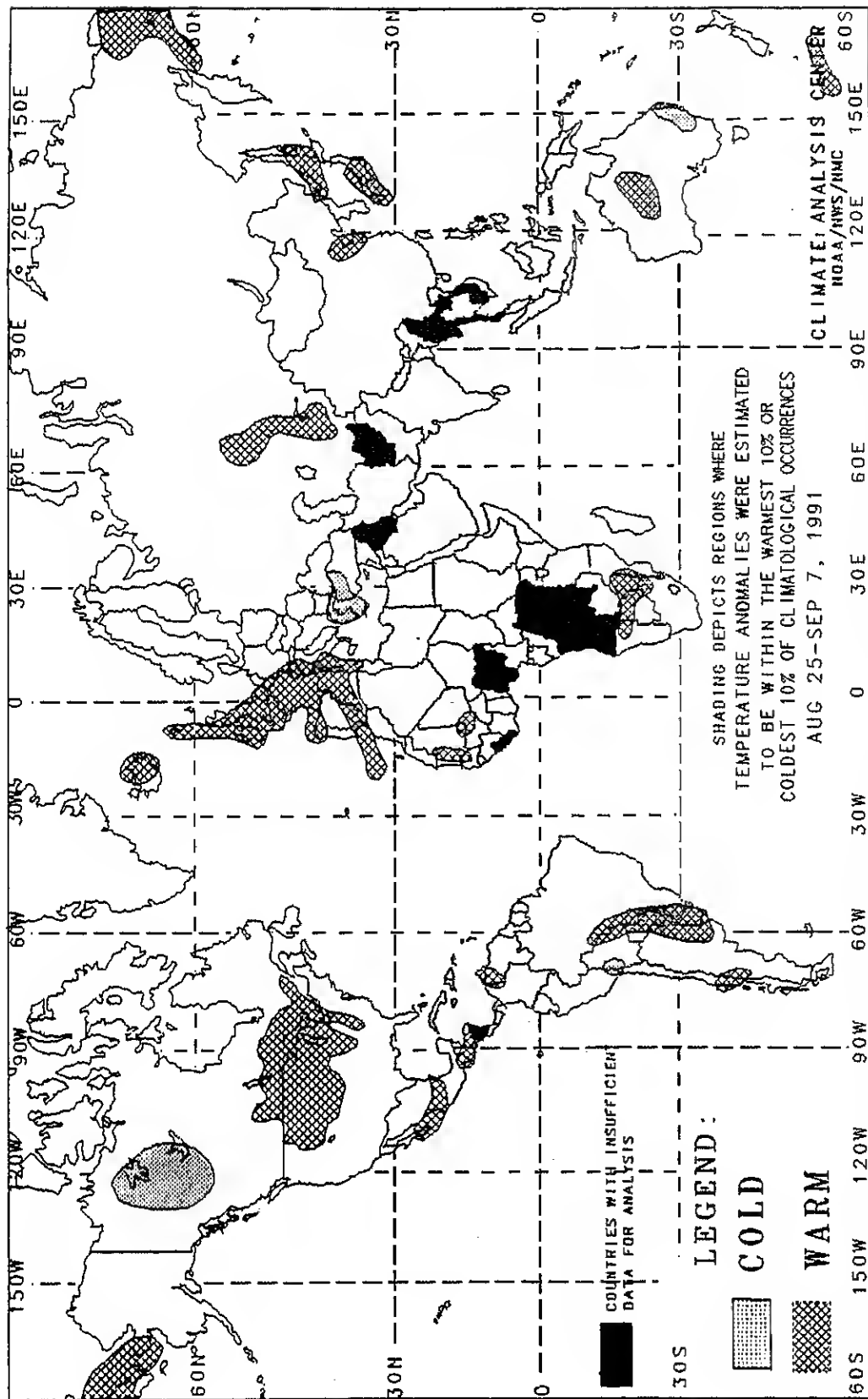
ACCUMULATED DEPARTURE FROM NORMAL CDD (SEASONAL)

Jan 1 - September 7, 1991



2-WEEK GLOBAL TEMPERATURE ANOMALIES

AUGUST 25 – SEPTEMBER 7, 1991



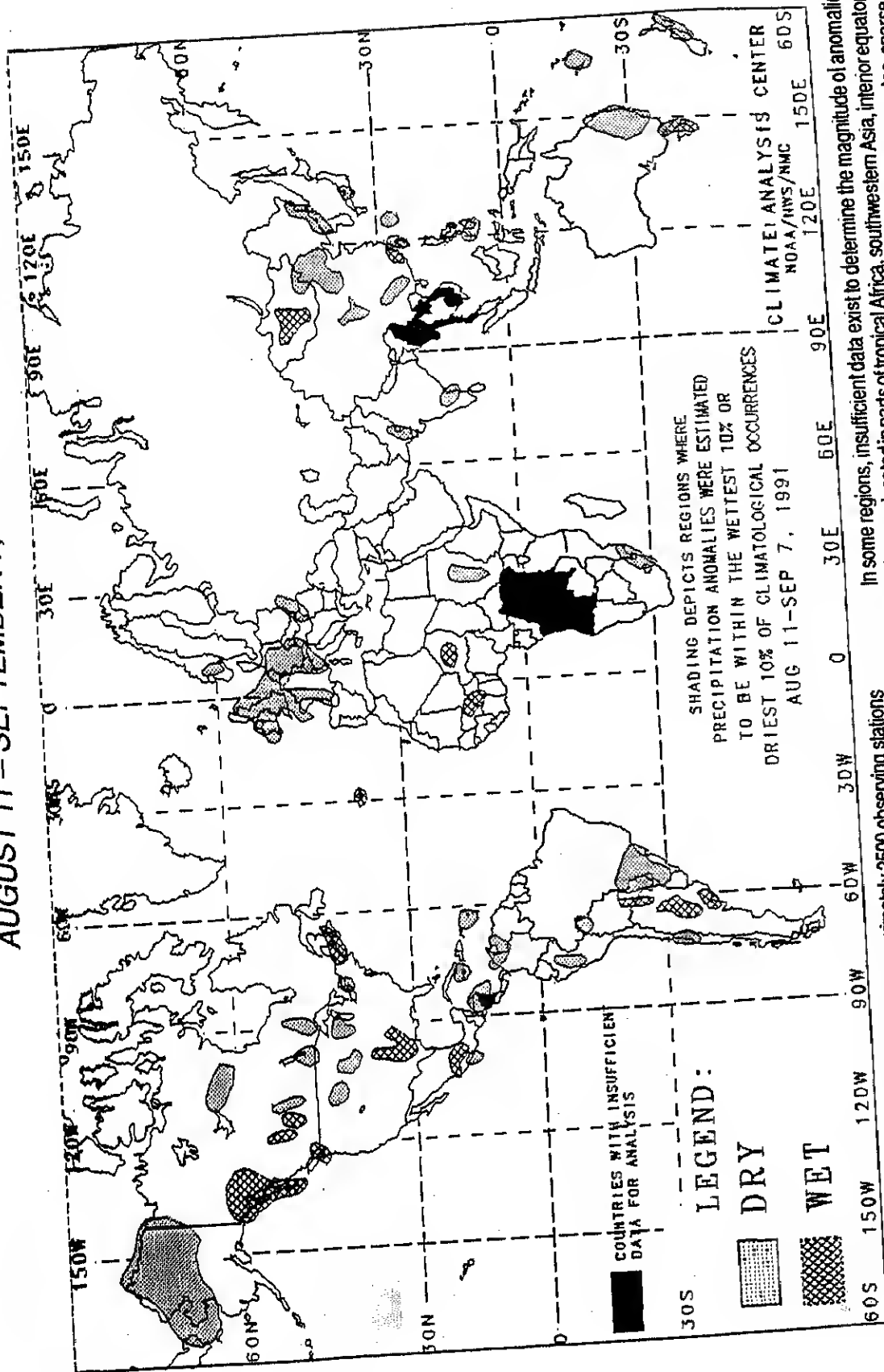
The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

4-WEEK GLOBAL PRECIPITATION ANOMALIES AUGUST 11 - SEPTEMBER 7, 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically and regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

UNITED STATES MONTHLY CLIMATE SUMMARY

AUGUST 1991

The first hurricane of the season, Bob, smashed into eastern New England on August 19, causing considerable damage with winds gusting to 120 mph and torrential rains of three to seven inches. The storm developed from a tropical depression northeast of the Bahamas on August 16 and strengthened as it moved northward, grazing the North Carolina coast. Total damage estimates, primarily in New England, ranked Bob as the second most destructive Hurricane (behind Hurricane Hugo) in terms of insurable losses. Total damage generated by Bob was estimated at \$1.5 billion. Bob combined with occasional heavy thunderstorms to dump up to five times the normal August rainfall on parts of New England. Elsewhere, thunderstorms drenched the South from eastern Texas to the southern Atlantic coast, causing localized flooding. In contrast, abnormally dry weather prevailed over much of the Corn Belt and mid-Atlantic region as thunderstorms were widely scattered. Despite a generally favorable start to the 1991 growing season, below normal rainfall has been measured across the primary corn and soybean belt during the three summer months (page 11).

August first commenced with stifling heat and humidity enveloping much of the deep South, where apparent temperatures topped 105°F in spots. The hot and humid conditions combined with an upper level disturbance to fuel severe thunderstorms from Texas to the southern Atlantic coast, where scattered flooding was observed. Heavy rains also produced isolated flash flooding in the mid-Atlantic, Northeast, Great Plains, and Rockies. Most of the Corn Belt and mid-Atlantic remained dry although sparse showers and thunderstorms brought needed rain to parts of these regions. Towards mid-month, strong thunderstorms continued to pound the southern Plains and Southeast, swelling rivers in northern Texas, Georgia, South Carolina, and northern Florida. Farther west, scattered monsoonal thunderstorms generated flash flooding in the Southwest and southern Rockies while the remnants of Tropical storm Hilda spread into northern and central California, producing rare summer showers. Torrential rain, associated with the remnants of Hurricane Fcfa, inundated eastern Hawaii, with Hilo measuring nearly 20 inches.

Near mid-month, Hurricane Bob moved rapidly into New England after grazing North Carolina's Outer Banks. The storm caused significant damage from New York to Maine before gradually weakening as it moved through Maine and into southeastern Canada. Elsewhere, brief and intense rain deluged parts of the southern Plains and Great Basin while unseasonably cool weather settled into the Mississippi Valley and deep South. In eastern and central Alaska, autumn-like conditions prevailed as lows dipped into the twenties, allowing frost to coat the Tanana Valley. During the latter part of the month, a late summer heat wave baked the Great Plains, Midwest, and Northeast. Triple digit readings were recorded as far north as southern Saskatchewan

while Philadelphia, PA tied a record established in 1988 with 49 days exceeding 90°F for the year. Strong thunderstorms again generated brief, heavy rains across the South, causing localized flooding. In contrast, little rain fell across the Ohio Valley and mid-Atlantic, where deficits of 2 to 4 inches have accumulated since mid-July.

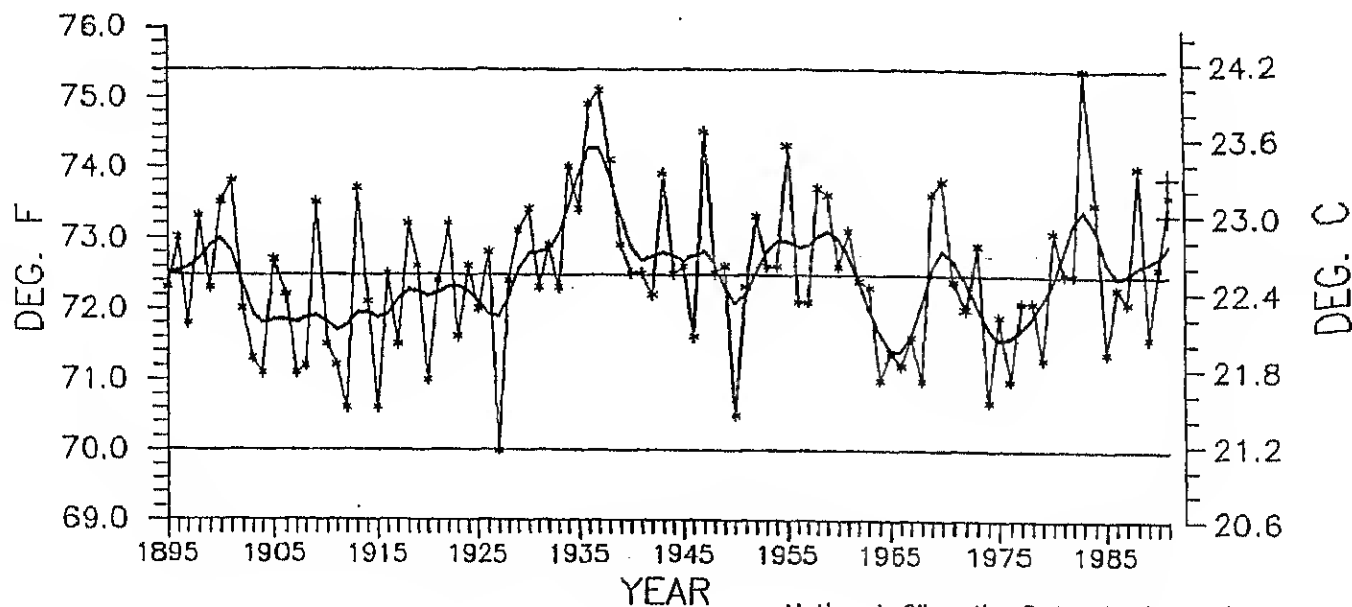
According to the River Forecast Centers, the largest monthly rainfall totals (more than 8 inches) fell on eastern Texas, the lower Mississippi Valley, the Southeast, the Alaskan panhandle, and eastern Hawaii as well as New England where Hurricane Bob contributed to much of the monthly total (Table 1). Above normal precipitation covered the Pacific Northwest Coast and much of the central and southern Rockies, southern Plains, lower Mississippi Valley, Southeast, Northeast, and scattered locations in the Far West, northern and central Plains, middle Mississippi and Ohio Valleys, Great Lakes, and mid-Atlantic (Figures 2 and 3). Regionally, the Northeast had the seventh wettest August according to the National Climatic Data Center, with the West and South the only other regions in the upper third of the historical distribution (page 11).

In contrast, less than half the usual August rains were reported in parts of the mid-Atlantic, upper and middle Mississippi and Ohio Valleys, Great Lakes, and much of the northern and central Plains, northern Rockies, northern and central Alaska, and western Hawaii. Seasonably dry conditions also prevailed in the Far West (Table 2, Figures 2 and 3). Regionally, the West North Central was very dry, having the 8th driest August on record. The East North Central, Central, and Southwest also ranked in the lower third of the historical distribution (page 11). The national precipitation index ranked August 1991 below the median, as the 35th driest August on record (page 10).

Despite brief periods of cool weather, temperatures continued to average well above normal across much of the country (see front cover). Departures greater than +2°F were observed over much of the northern third of the nation, the desert Southwest, and southern Texas (Figure 4). Temperatures also averaged near to above normal in Hawaii and southern Alaska. Regionally, the West North Central had its 6th warmest August on record, with the Northwest, Northeast, East North Central, and Southwest also ranking in the upper third of the historical distribution (page 11). Nationally, August 1991 was the 16th warmest on record (page 10), with the year to date average (January–August, 1991) ranking as the 6th warmest such period (page 17).

Cool weather settled only into California, portions of the southern Plains, and northern and central Alaska, where departures below -2°F were observed (page 15). Regionally, only the South experienced below-median temperatures, having the 33rd coolest August on record (page 11).

U.S. NATIONAL TEMPERATURE AUGUST, 1895-1991



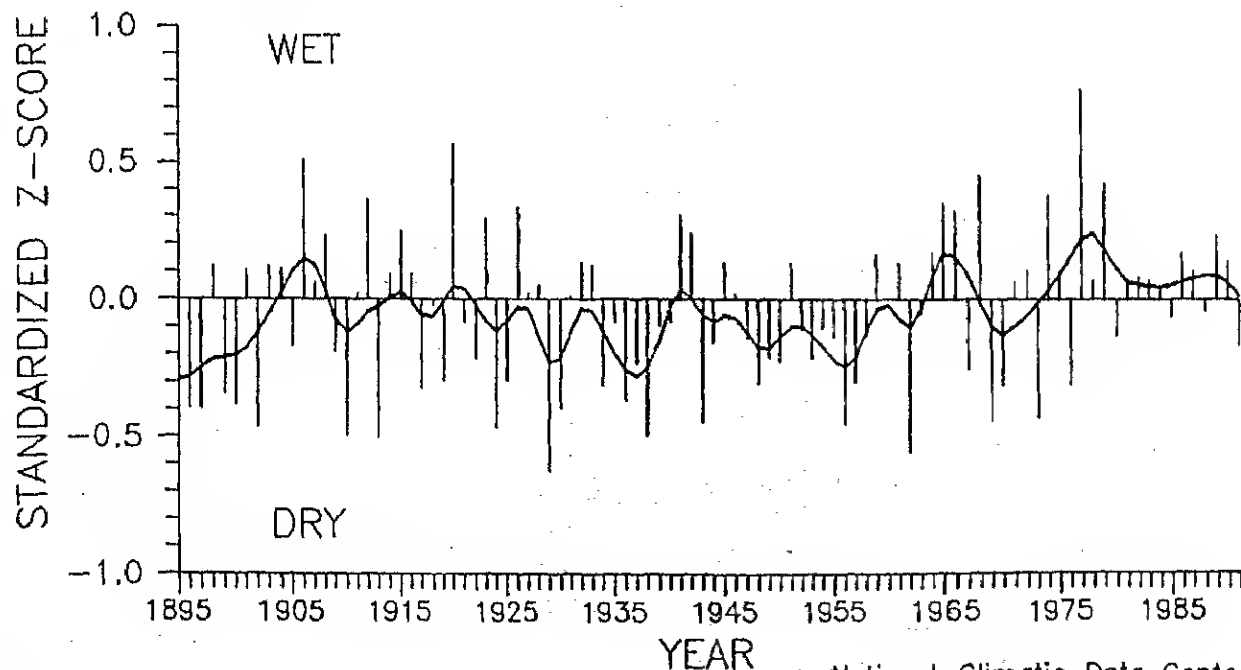
National Climatic Data Center, NOAA

STRAIGHT HORIZONTAL LINES ARE:
MAXIMUM VALUE (TOP),
LONG-TERM AVERAGE (MIDDLE),
MINIMUM VALUE (BOTTOM)

CONFIDENCE INTERVAL
FOR CURRENT YEAR IS
INDICATED BY '*'

Nationally Averaged August Temperatures, As Computed by the National Climatic Data Center. *August 1991 ranked as the 16th warmest August on record. Approximately 25 percent of the country recorded well above normal temperatures, with less than 3 percent reporting significantly below normal readings.*

U.S. NATIONAL WEIGHTED MEAN PRECIPITATION INDEX AUGUST, 1895-1991



National Climatic Data Center, NOAA

National Mean August Precipitation Index, 1895-1991, As computed by the National Climatic Data Center. *August 1991 ranked as the 35th driest August on record. This index takes local normals into account so that typically wet regions do not dominate the index value.*

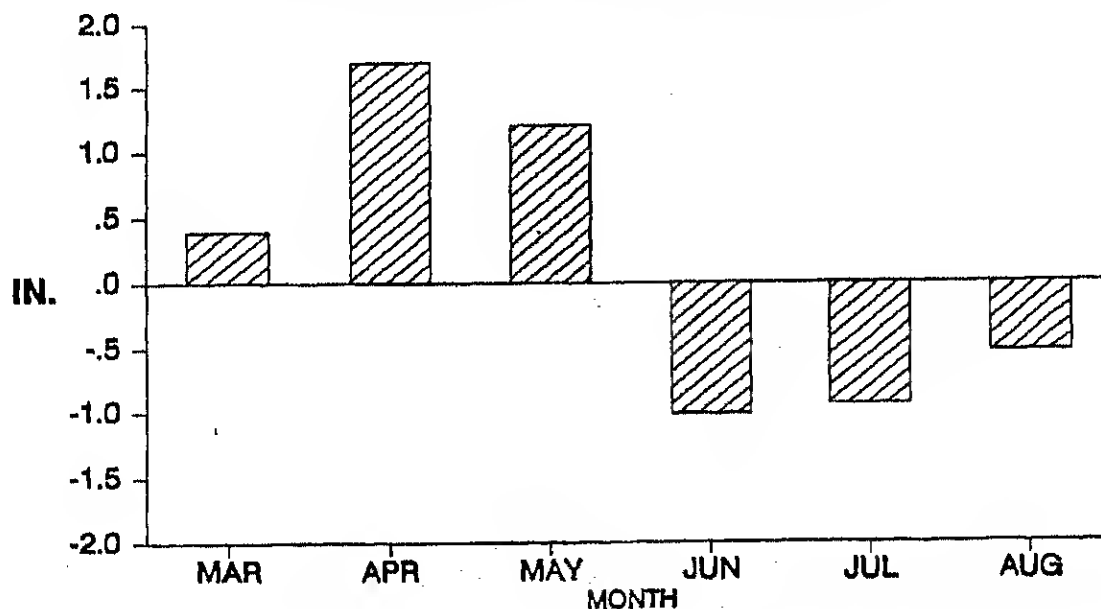
TEMPERATURE AND PRECIPITATION RANKINGS FOR AUGUST 1991, BASED ON THE PERIOD 1895 TO 1991. 1 = DRIEST/COLDEST AND 97 = WETTEST/HOTTEST.

| <u>REGION</u> | <u>PRECIPITATION</u> | <u>TEMPERATURE</u> |
|--------------------|----------------------|--------------------|
| NORTHEAST | 90 | 84 |
| EAST NORTH CENTRAL | 26 | 76 |
| CENTRAL | 29 | 62 |
| SOUTHEAST | 52 | 59 |
| WEST NORTH CENTRAL | 8 | 92 |
| SOUTH | 79 | 33 |
| SOUTHWEST | 31 | 69 |
| NORTHWEST | 70 | 87 |
| WEST | 65 | 57 |
| NATIONAL | 35 | 82 |

National Climatic Data Center

PRIMARY CORN AND SOYBEAN BELT

PRECIPITATION DEPARTURE, 3/1991-8/1991



National Climatic Data Center, NOAA

Departure from Normal Precipitation across the Primary Corn and Soybean Belt for March-August, 1991. Although the region observed above normal precipitation for spring and summer as a whole, the primary corn and soybean belt (see back cover for a specific definition of the region) has recorded below normal rainfall for the last three months following a wet spring.

TABLE 1. SELECTED STATIONS WITH 150% OR MORE OF THE NORMAL PRECIPITATION AND 8.00 INCHES OR MORE PRECIPITATION; OR, STATIONS WITH 10.00 INCHES OR MORE PRECIPITATION AND NO NORMALS DURING AUGUST 1991.

| <u>STATION</u> | <u>TOTAL</u> <u>(INCHES)</u> | <u>PCT. OF</u> <u>NORMAL</u> | <u>STATION</u> | <u>TOTAL</u> <u>(INCHES)</u> | <u>PCT. OF</u> <u>NORMAL</u> |
|---------------------------|---------------------------------|---------------------------------|-------------------------|---------------------------------|---------------------------------|
| YAKUTAT, AK | 28.28 | 281.1 | MACON/WARNER-ROBINS, GA | 9.65 | 273.4 |
| HILO/LYMAN, HAWAII, HI | 26.64 | 266.4 | JUNEAU, AK | 9.56 | 191.2 |
| MT WASHINGTON, NH | 21.07 | 278.0 | EASTPORT, ME | 9.38 | 308.6 |
| PORTLAND, ME | 15.22 | 543.8 | ANDERSON, SC | 9.37 | 251.9 |
| QUILLAYUTE, WA | 15.07 | 517.9 | SHREVEPORT, LA | 9.23 | 372.2 |
| CAPE HATTERAS, NC | 13.19 | 215.9 | AUGUSTA, ME | 9.04 | 286.1 |
| VERO BEACH, FL | 10.89 | 202.0 | GREENVILLE, SC | 9.02 | 224.4 |
| SITKA, AK | 10.71 | 161.6 | HARTFORD, CT | 8.69 | 218.3 |
| RUMFORD, ME | 10.68 | 290.2 | MACON, GA | 8.63 | 237.1 |
| SAVANNAH, GA | 10.51 | 158.0 | LUFKIN, TX | 8.48 | 344.7 |
| BRUNSWICK NAS, ME | 10.18 | 259.0 | MELBOURNE/RGNL, FL | 8.44 | 172.2 |
| COLUMBUS, GA | 10.11 | 251.5 | LITTLE ROCK, AR | 8.43 | 276.4 |
| PORTSMOUTH/PEASE AFB, NH | 10.10 | *** | CHARLOTTE, NC | 8.18 | 219.9 |
| CHICOPEE/WESTOVER AFB, MA | 9.66 | 233.9 | | | |

NOTE: Stations without precipitation normals are indicated by asterisks.

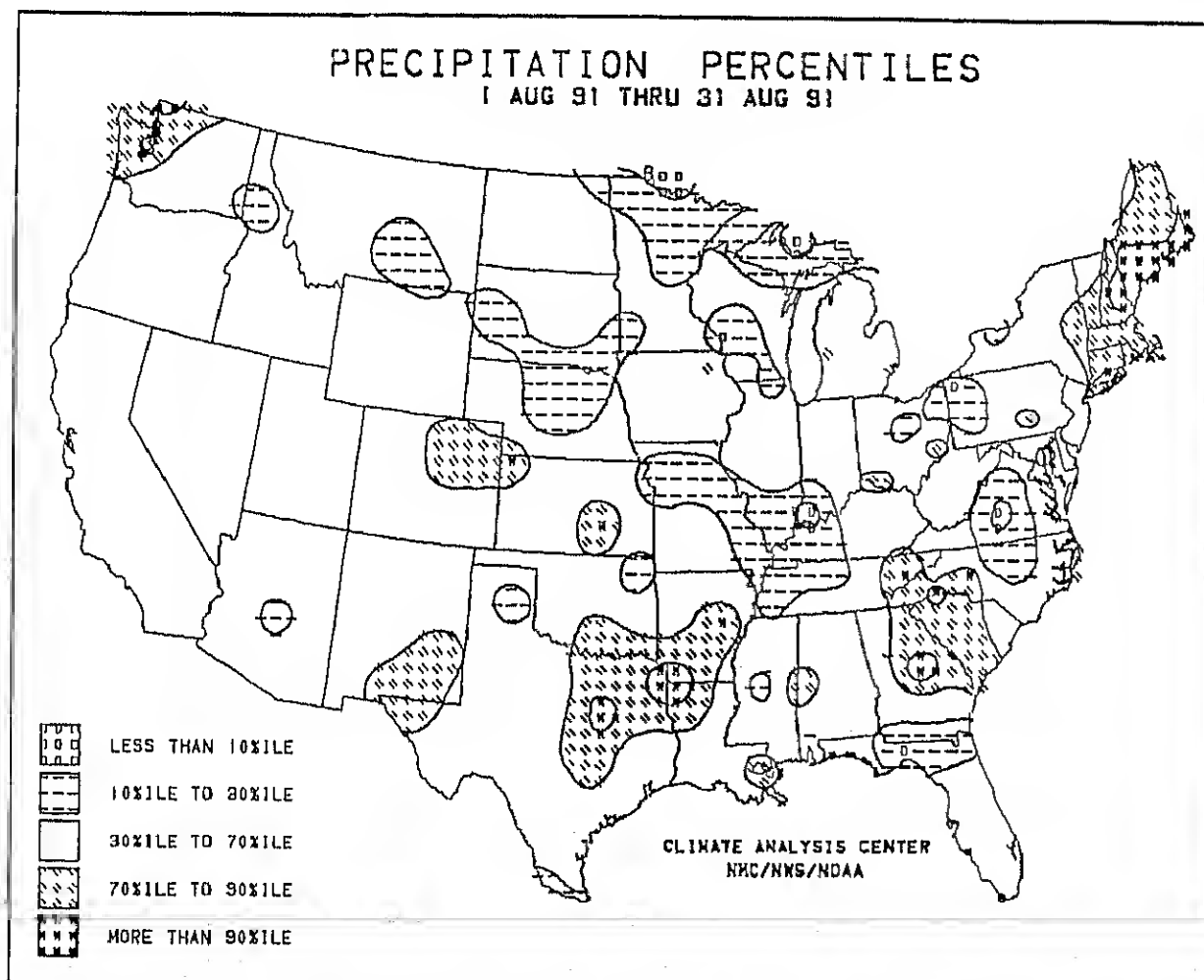


FIGURE 1. August 1991 Precipitation Percentiles. Significant dryness in August [$<30\%$ ile] was observed in portions of the northern and southern Intermountain West, northern and central Plains, Great Lakes, upper and middle Mississippi and Ohio Valleys, mid-Atlantic, and northern Florida. Significant wetness [$>70\%$ ile] affected most of New England (primarily due to rains from Hurricane Bob) and parts of the Pacific Northwest, southern and central Rockies, southern and central Plains, lower Mississippi Valley, and Southeast.

TABLE 2. SELECTED STATIONS WITH 50% OR LESS OF THE NORMAL PRECIPITATION AND NORMAL PRECIPITATION OF 3.00 INCHES OR MORE DURING AUGUST 1991.

| STATION | TOTAL (INCHES) | PCT. OF NORMAL | NORMAL (INCHES) | STATION | TOTAL (INCHES) | PCT. OF NORMAL | NORMAL (INCHES) |
|-----------------------|-------------------|-------------------|--------------------|-------------------------|-------------------|-------------------|--------------------|
| LYNCHBURG, VA | 0.40 | 10.8 | 3.69 | ENID/VANCE AFB, OK | 1.44 | 42.2 | 3.41 |
| EVANSVILLE, IN | 0.46 | 15.0 | 3.07 | MARTINSBURG, WV | 1.46 | 40.4 | 3.61 |
| LA CROSSE, WI | 0.63 | 16.9 | 3.72 | JACKSON, MS | 1.49 | 41.8 | 3.58 |
| PELLSTON, MI | 0.67 | 20.3 | 3.30 | EAU CLAIRE, WI | 1.52 | 35.5 | 4.28 |
| NOME, AK | 0.78 | 24.6 | 3.09 | SAULT STE MARIE, MI | 1.55 | 45.1 | 3.44 |
| ESCENABA, MI | 0.76 | 22.9 | 3.32 | PITTSBURGH, PA | 1.63 | 49.5 | 3.29 |
| MARQUETTE, MI | 0.81 | 24.9 | 3.25 | ILIAMNA, AK | 1.63 | 31.8 | 5.13 |
| YOUNGSTOWN, OH | 0.86 | 24.9 | 3.45 | ROCKFORD, IL | 1.69 | 45.8 | 3.69 |
| CHANUTE, KS | 0.95 | 23.9 | 3.98 | MORGANTOWN, WV | 1.75 | 38.3 | 4.57 |
| WASHINGTON/DULLES, VA | 1.00 | 24.4 | 4.09 | TOPEKA, KS | 1.76 | 47.7 | 3.69 |
| REDWOOD FALLS, MN | 1.06 | 31.3 | 3.39 | ZANESVILLE, OH | 1.87 | 49.6 | 3.77 |
| LINCOLN, NE | 1.26 | 36.8 | 3.42 | RALEIGH-DURHAM, NC | 1.87 | 42.2 | 4.43 |
| KANSAS CITY/INTL, MO | 1.35 | 35.6 | 3.79 | GREENSBORO, NC | 1.91 | 45.8 | 4.17 |
| EL DORADO, AR | 1.39 | 45.7 | 3.04 | WASHINGTON/NATIONAL, DC | 2.03 | 46.3 | 4.38 |
| PONCA CITY, OK | 1.39 | 41.4 | 3.35 | KEY WEST, FL | 2.23 | 47.5 | 4.69 |
| SIOUX FALLS, SD | 1.41 | 45.3 | 3.11 | JACKSONVILLE, FL | 3.48 | 44.5 | 7.82 |

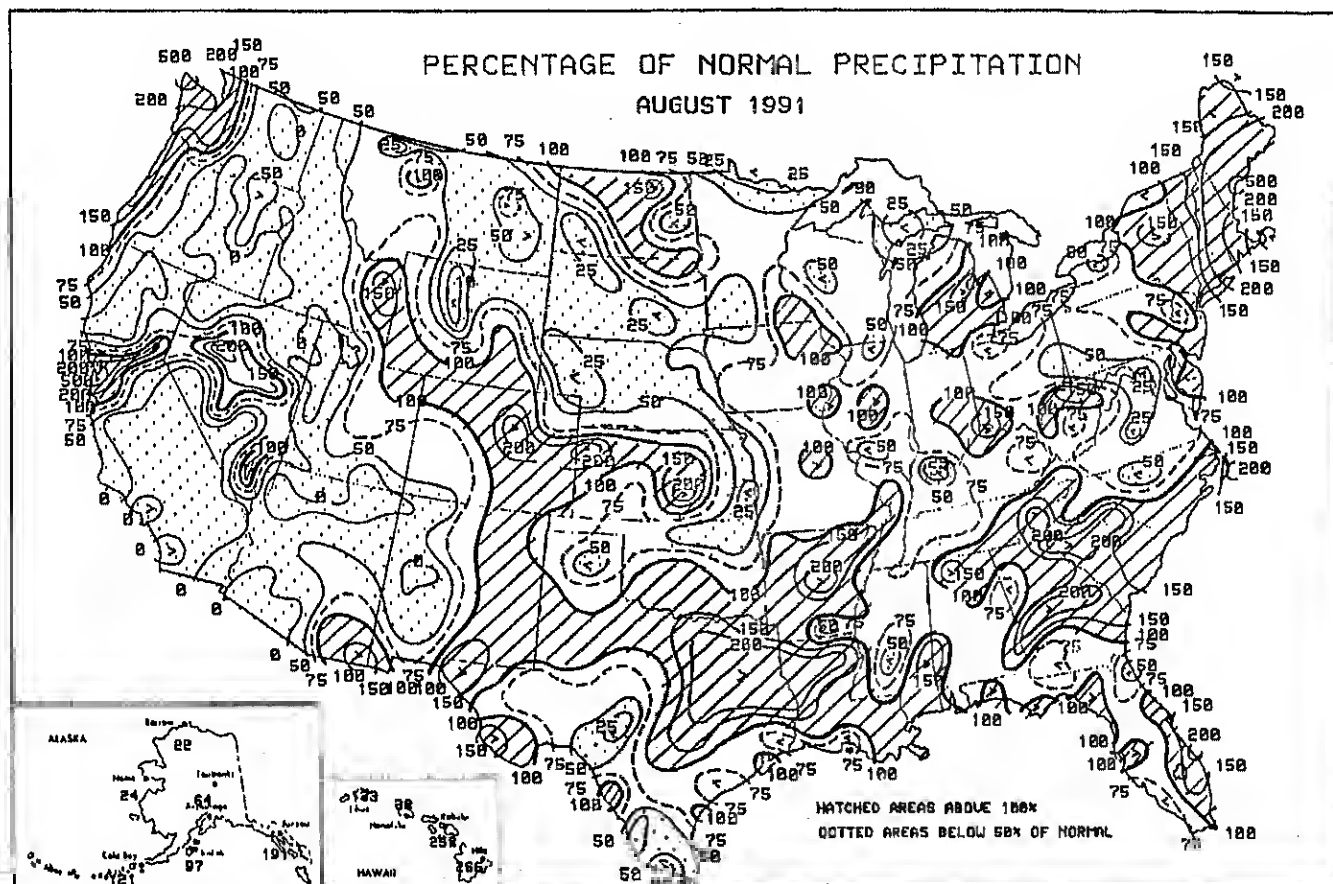


FIGURE 2. August 1991 Percent of Normal Precipitation. Isopleths drawn for 0, 25, 50, 75, 100, 150, 200, and 500 percent. Hurricane Bob contributed to well above normal rainfall in New England where up to five times the normal rainfall was measured. Heavy rain also fell in portions of eastern Texas, the lower Mississippi Valley, the Southeast, and eastern Washington where more than twice the normal rainfall was observed. In contrast, less than half of normal rainfall was measured in parts of the mid-Atlantic, Great Lakes, Corn Belt, lower Mississippi and lower Rio Grande Valleys, Southeast, and much of the northern and central Plains. Most of the far West was typically dry.

TABLE 3. AUGUST 1991 AVERAGE TEMPERATURE 4.0°F OR MORE ABOVE NORMAL.

| <u>STATION</u> | <u>DEPARTURE</u> (°F) | <u>AVERAGE</u> (°F) | <u>STATION</u> | <u>DEPARTURE</u> (°F) | <u>AVERAGE</u> (°F) |
|-------------------------|--------------------------|------------------------|----------------------|--------------------------|------------------------|
| HELENA, MT | +7.0 | 72.9 | WORLAND, WY | +4.5 | 73.2 |
| GLASGOW, MT | +5.9 | 75.0 | RENO, NV | +4.5 | 71.4 |
| BURLEY, ID | +5.7 | 73.7 | GRAND FORKS, ND | +4.5 | 71.4 |
| BOZEMAN, MT | +5.6 | 70.2 | DICKINSON, ND | +4.4 | 72.6 |
| BILLINGS, MT | +5.2 | 75.6 | MILES CITY, MT | +4.3 | 76.6 |
| BISMARCK, ND | +5.0 | 73.8 | HAVRE, MT | +4.3 | 72.5 |
| WILLISTON, ND | +5.0 | 73.6 | GREAT FALLS, MT | +4.3 | 71.8 |
| BOISE, ID | +4.7 | 76.6 | BUTTE, MT | +4.3 | 65.1 |
| SHERIDAN, WY | +4.7 | 73.0 | MISSOULA, MT | +4.1 | 69.6 |
| LEWISTOWN, MT | +4.7 | 69.1 | HANCOCK/HOUGHTON, MI | +4.1 | 67.2 |
| INTERNATIONAL FALLS, MN | +4.7 | 67.8 | JAMESTOWN, ND | +4.0 | 72.2 |
| CUT BANK, MT | +4.7 | 66.9 | DEVIL'S LAKE, ND | +4.0 | 70.3 |
| PHOENIX, AZ | +4.5 | 94.5 | | | |

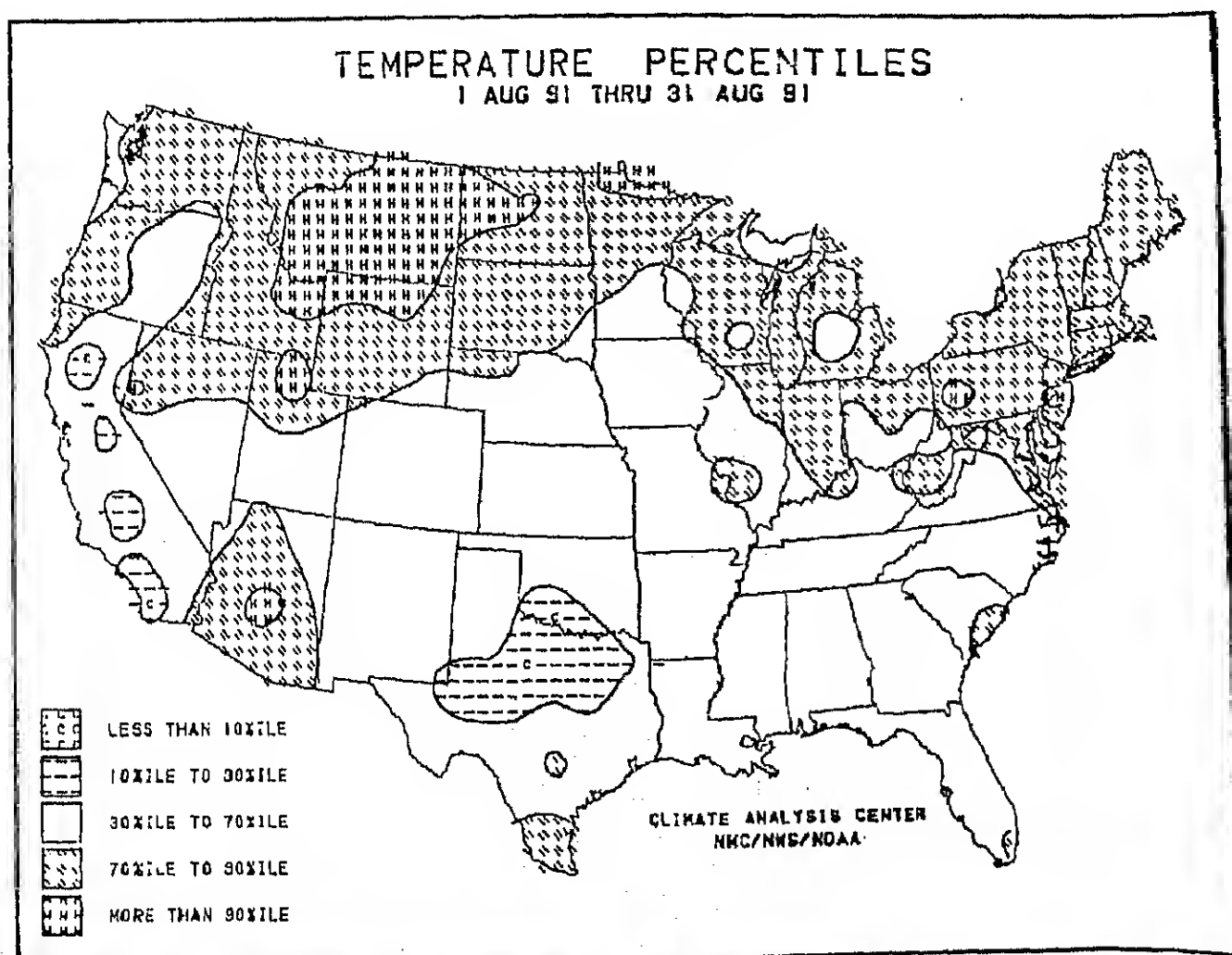


FIGURE 3. August 1991 Temperature Percentiles. *Significant warmth [$>70\%$ ile] was recorded over most of the northern third of the nation and in the desert Southwest and southern Texas. In contrast, unusually cool conditions [$<30\%$ ile] were limited to California and the southern Plains.*

TABLE 4. AUGUST 1991 AVERAGE TEMPERATURE 2.0°F OR MORE BELOW NORMAL.

| STATION | DEPARTURE (°F) | AVERAGE (°F) | STATION | DEPARTURE (°F) | AVERAGE (°F) |
|-------------------------|-------------------|-----------------|-----------------------|-------------------|-----------------|
| ILENE, TX | -4.0 | 79.2 | UKIAH, CA | -2.5 | 70.5 |
| SILL/HENRY POST AAF, OK | -3.5 | 79.6 | GULKANA, AK | -2.4 | 51.2 |
| TTLES, AK | -3.4 | 51.8 | WINSLOW, AZ | -2.3 | 73.8 |
| D BLUFF, CA | -3.4 | 76.7 | DALLAS-FT WORTH, TX | -2.3 | 82.6 |
| DDING, CA | -3.4 | 77.7 | THERMAL, CA | -2.3 | 88.0 |
| CUMCARI, NM | -3.3 | 73.9 | FAIRBANKS, AK | -2.2 | 54.3 |
| OLAND, TX | -3.2 | 77.5 | DEMING, NM | -2.2 | 75.9 |
| CHITA FALLS, TX | -3.2 | 81.1 | WACO, TX | -2.2 | 83.5 |
| KERSFIELD, CA | -2.9 | 79.5 | MEACHAM, OR | -2.1 | 59.8 |
| OCKTON, CA | -2.7 | 73.6 | HOBART, OK | -2.1 | 79.9 |
| N ANGELO, TX | -2.7 | 80.2 | DALLAS/LOVE FIELD, TX | -2.0 | 83.6 |
| JE CANYON, CA | -2.5 | 64.4 | | | |

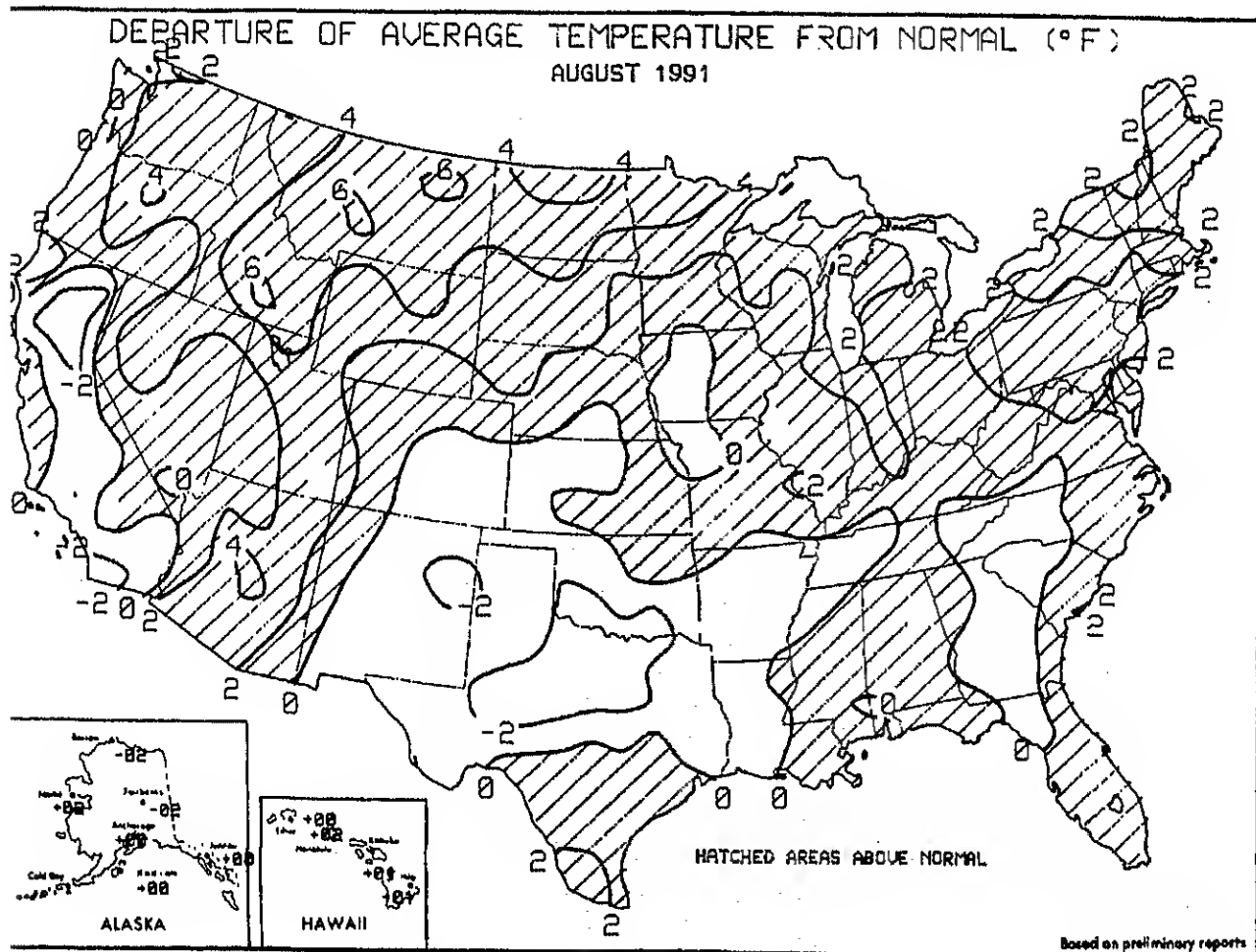


FIGURE 4. August 1991 Departure of Average Temperature from Normal (°F). Isoleths drawn for -2°F, 0°F, 2°F, 4°F, and 6°F. Warmer than normal conditions encompassed much of the nation, with monthly departures of up to +6°F observed in Idaho and Montana. Abnormally cool conditions, featuring departures below 2°F were limited to California and the southern Plains.

TABLE 5. RECORD AUGUST PRECIPITATION.

| <u>STATION</u> | <u>TOTAL</u> (INCHES) | <u>NORMAL</u> (INCHES) | <u>PCT. OF</u> <u>NORMAL</u> | <u>RECORD</u> <u>TYPE</u> | <u>RECORDS</u> <u>BEGAN</u> |
|-------------------------|--------------------------|---------------------------|---------------------------------|------------------------------|--------------------------------|
| Yakutat, AK | 28.27 | 10.06 | 281.0 | HIGHEST | 1941 |
| Hilo, HI | 26.64 | 10.00 | 266.4 | HIGHEST | 1943 |
| Mt. Washington, NH | 20.27 | 7.58 | 267.4 | HIGHEST | 1944 |
| Portland, ME | 15.22 | 2.80 | 543.6 | ALL-TIME HIGHEST | 1947 |
| Quillayute, WA | 15.07 | 2.91 | 517.9 | HIGHEST | 1966 |
| Shreveport, LA | 9.23 | 2.48 | 372.2 | HIGHEST | 1947 |
| Greenville, SC | 9.02 | 4.02 | 224.4 | HIGHEST | 1951 |
| Macon, GA | 8.63 | 3.64 | 237.1 | HIGHEST | 1934 |
| Concord, NH | 7.26 | 3.26 | 222.7 | HIGHEST | 1942 |
| Key West, FL | 2.23 | 4.69 | 47.5 | LOWEST | 1945 |
| Marquette, MI | 0.83 | 3.25 | 25.5 | LOWEST | 1979 |
| International Falls, MN | 0.58 | 3.44 | 16.9 | LOWEST | 1939 |
| Kotzebue, AK | 0.08 | 2.03 | 3.9 | LOWEST | 1929 |

NOTE: Trace precipitation is considered ZERO precipitation. Stations with no precipitation are only included if normal precipitation is 0.25 inches or more.

TABLE 6. RECORD AUGUST AVERAGE TEMPERATURES.

| <u>STATION</u> | <u>AVERAGE</u> (°F) | <u>NORMAL</u> (°F) | <u>DEPARTURE</u> (°F) | <u>RECORD</u> <u>TYPE</u> | <u>RECORDS</u> <u>BEGAN</u> |
|----------------|------------------------|-----------------------|--------------------------|------------------------------|--------------------------------|
| Helena, MT | 72.9 | 65.8 | +7.1 | HIGHEST | 1880 |
| Eastport, ME | 66.0 | 62.6 | +3.4 | ALL-TIME HIGHEST | 1874 |

TABLE 7. RECORD AUGUST EXTREME TEMPERATURES.

| <u>STATION</u> | <u>EXTREME</u> (°F) | <u>DATE</u> | <u>RECORD</u> <u>TYPE</u> | <u>RECORDS</u> <u>BEGAN</u> |
|-------------------------|------------------------|-------------|------------------------------|--------------------------------|
| Chicago/O'Hare, IL | 101 | August 2 | HIGHEST | 1958 |
| International Falls, MN | 95 | August 27 | HIGHEST | 1939 |
| Eureka, CA | 82 | August 7 | HIGHEST | 1911 |
| Tallahassee, FL | 60 | August 21 | LOWEST | 1940 |
| Jackson, MS | 55 | August 21 | LOWEST | 1963 |

PRECIPITATION RANKINGS FOR JAN-AUG 1991, BASED ON THE PERIOD 1895 TO 1990. 1 = DRIEST, 97 = WETTEST.

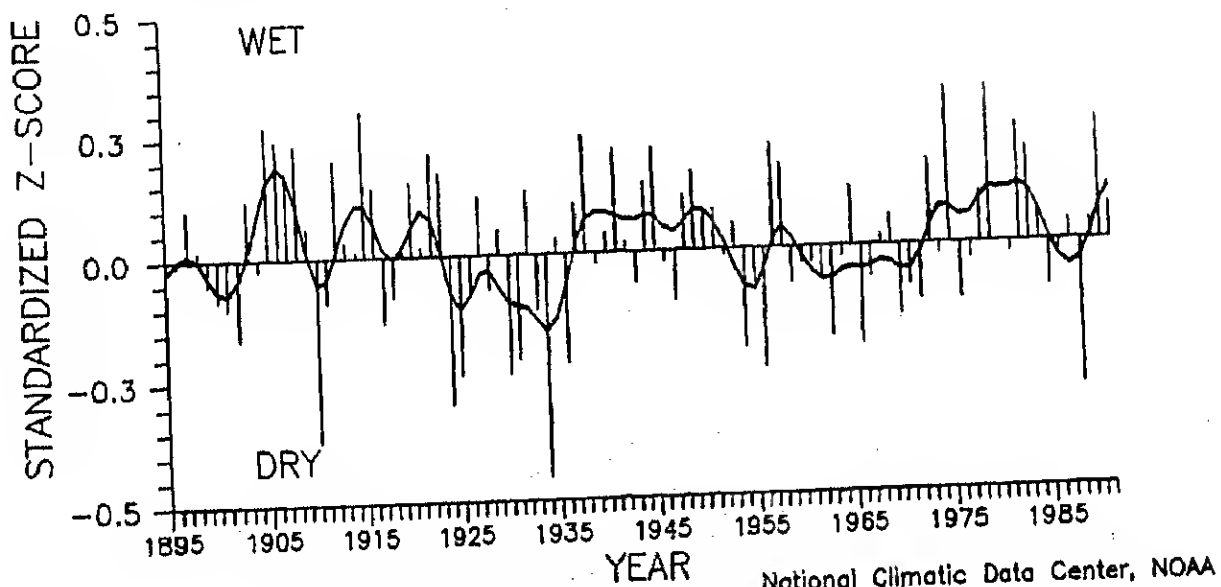
| <u>STATE</u> | <u>RANK</u> | <u>STATE</u> | <u>RANK</u> | <u>STATE</u> | <u>RANK</u> | <u>STATE</u> | <u>RANK</u> |
|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| AL | 91 | IA | 73 | NE | 56 | RI | 64 |
| AZ | 31 | KS | 21 | NV | 46 | SC | 94 |
| AR | 80 | KY | 35 | NH | 67 | SD | 87 |
| CA | 60 | LA | 97 | NJ | 58 | TN | 75 |
| CO | 40 | ME | 48 | NM | 62 | TX | 86 |
| CT | 75 | MD | 7 | NY | 20 | UT | 48 |
| DE | 49 | MA | 60 | NC | 67 | VT | 52 |
| FL | 97 | MI | 76 | ND | 47 | VA | 22 |
| GA | 96 | MN | 77 | OH | 5 | WA | 81 |
| ID | 35 | MS | 97 | OK | 33 | WV | 15 |
| IL | 15 | MO | 26 | OR | 43 | WI | 71 |
| IN | 12 | MT | 68 | PA | 5 | WY | 76 |

National Climatic Data Center

Top 10 rankings : **BOLD**

Bottom 10 rankings : *Italics*

**U.S. NATIONAL WEIGHTED MEAN PRECIPITATION INDEX
JANUARY-AUGUST, 1895-1991**



January - August Nationally Averaged Precipitation Index, 1895-1991, as Computed By The National Climatic Data Center. *January through August 1991 recorded above median precipitation (34th wettest such period) primarily due to the wet Spring. This index takes local normals into account so that typically wet areas do not dominate the index.*

The 9 U.S. Regional Boundaries as Defined by the National Climatic Data Center (NCDC) and Regularly used in the Monthly and Seasonal U.S. Climate Summaries.

